APPENDIX D.

Description of Forests and Working Circles, Sukkur Range.

Range.	Forest.	Area.	Boundaries.	Situation, configuration and soil.	Description of stock.	Remarks.
		A. g.				
Sukkur ...	Garhi Halim.	2,067 0	Bounded on the north by revenue lands of dehs Garhi Halim, Nao wah and Nimhoro; on the east by revenue land of deh Nimhoro; on the south by revenue lands of dehs Nimhoro and Garhi Halim; and on the west by revenue land of deh Garhi Halim.	About 9 miles south-east of Shikarpur. The soil is a light sandy loam, arid in parts due to insufficient water, and kalar appears on the surface in several places. Formerly the forest depended on the overflow of the river. Now it gets water occasionally from a branch of the Sind wah running through from south-west to north-east. A sluice is opened in compartment 23. Zamindari canals irrigate portions on the east.	The growth is kandi and lai, chiefly coppice ... The densest crops are found in the eastern compartments, and in portions of compartments B7, C7, C8 and B8 on the west. Those on the south-west are very poor and consist of only scattered kandi and indifferent lai standing on kalar soil along the boundaries, where percolation from neighbouring cultivation assists, the growth is somewhat fresher. Density: Varies from 1 to ·9. Quality: The growth is stunted and not well grown, but the wood is fit for fuel. Reproduction: Coppice regeneration in felled coupes is satisfactory in the beginning, but advance is slow after. In some instances, under irrigation, rapid progress is made. Kandi seedlings are not numerous. A babul plantation begun about 8 years ago with rice or other cereal crops stands in parts of compartments B7, C7, C8 and B8. Some of the plants are from 4″ to 6″ in diameter; but plants of later sowings, not subsequently irrigated, are said to have been killed off by frost and replaced by self-sown kandi. Indications are not wanting of further replacement by kandi or babul that is not doing well. Working Circle I—North.	Three more sluices in the Shakh wah with water to spare would largely benefit the forest.
...	Lakhi ...	3,721 20	Bounded on the north by revenue lands of dehs Lakhi, Wazirabad and Nimhoro; on the east by revenue lands of dehs Nuro and Mangrani; on the south by revenue lands of dehs Magrani, Maka (taluka Naushahro Abro) and Bagarji forest; and on the west by revenue land of deh Lakhi.	About 4 miles to the north-east of the railway at Ruk. Soil, a fair sandy loam with patches of kalar in the north and along the west. The forest now depends for irrigation on the Mir wah on its northern boundary and other small irrigation outlets passing through it. The Sukkur-Shikarpur road passing through divides the forest into two nearly equal parts.	A mixed kandi and lai crop, chiefly coppice, the former varying from 4″ to 8″ in diameter. The density is fairly even all through except in a large patch on the north and along the west, where irrigation has not been sufficient. Irrigation from the Mir and Gat wahs is not regular but depends, on spill and breaches in the banks. Average density: ·8. Quality: Fairly well grown and fit for fuel. Reproduction: Good. Success here is due to the immense amount of rice cultivation that is done requiring large supplies of water which, running to waste, irrigates the forest. Working Circle II—South. The stock comprised in this part is similar to that in the north in respect of composition and density. Kalar shows itself in places on the west, where the growth is poor, but the greater part of the working circle is irrigated by zamindari karias leading water to revenue cultivation inside and outside the forest. The surrounding cultivation being rice, not a little of the water used, finds its way into the forest. Average density: As above. Reproduction: as above.	Irrigation should be regulated by clearing old water channels and erecting bands where the water is likely to escape. A couple of sluices are wanted in the Mir wah.
...	Andaldal.	10,138 12	Bounded on the north by the North-Western Railway and revenue lands of dehs Masti Khan Dal, Fohyar, Ruk, Shah Kali, Saharji and Kulwari; on the east by revenue lands of deh Jhali and Keti Bagerji forest; on the south by Keti Bagerji forest and Murad Ali Khan Talpur's jagir; and on the west by revenue lands of deh Pandhi and jagir Dingari.	About 1·4 miles to the south of the railway at Ruk. Configuration:—Level. The soil is a light sandy loam, changing often to pure sand at or near the surface. The Jhali bund, a Public Works Department work, divides the forest into two nearly equal parts, north and south. Irrigation depends on the Sarhadi and Bhur dhands and small dhoros branching from these which bring in river water. The Jali band has only one sluice opening in compartment D7. The rest of the northern portion is therefore entirely cut off.	For the purpose of the working plans, the forest is divided into 3 working circles, north, south and east:— Working Circle I—North. The greater part of this working circle lies to the north of the Jhali band and is therefore not inundated, except for a small area opposite to the opening in compartment D7. Kandi occurs mixed with lai, and unmixed often, and is fairly dense. A big blank is seen in the north-east, and other blanks are seen east and west, due to sandy soil and insufficient water. South of the band the area is inundated by the Bhur and Kini dhands and the principal crop in this part is lai, kandi, bahan and babul are each represented, the first increasing towards the east. Babul is confined to the dhands. Fellings having been long continued, the growth is principally coppice. Average density: ·8. Quality: Poor and stunted in the north, but fit for fuel. Reproduction: Coppice regeneration good at start, but slow after, for want of water. Seedlings are nearly absent. Recent seedlings are confined to compartments south of the band. Working Circle II—South. This comprises that part of the forest lying between the outer boundaries and two lines at	More sluices are needed in the Jhali band.

Range.	Forest.	Area.	Boundaries.	Situation, configuration and soil.	Description of stock.	Remarks.
		A. g.				
Sukkur—*continued.*	Andaldal—*continued.*	10,138 12			right angles to each other from the intersection near got Bhangadaru. This part like the last has been repeatedly felled over both before and since 1895-96. Lai coppice everywhere with kandi in most compartments. Bahan occurs scattered, but in compartment O7 it is found dense and nearly unmixed. Babul stands on the banks of the Bhur and Sarhadi dhands. The extreme south-west is a lowlying kacha covered with immature lai and partly used for growing of field crops. Blanks are seen in the north-eastern compartments capable of growing only ak (*calatropis procera*). Bahan and babul are the only tree-growth, the rest is coppice, except on the kacha. Average density: ·8. Quality: Thriving in parts, yearly inundated and indifferent elsewhere. Reproduction: Good in closed areas as regards after-growth from fellings. Seedlings are better represented in the southern compartments, where they are often dense but lack protection from browsers. Coupes of 1897-98 in compartments O5 and O6 show poor results; lai is dying out for want of water. WORKING CIRCLE III—EAST. A small part of this working circle lies to the north of the Jhali bund and is not irrigated. The remaining part is partly irrigated in ordinary floods and partly not, the latter being due to up-lands to which the water does not ordinarily rise. A number of blanks is therefore indicated. Kandi predominates and where well flooded is mixed with lai and asri. Babul and bahan are seen near the Sarhadi dhand and the Jhali band. Lai unmixed is established in the beds of dhoros and depressions and along the bank of the Sarhadi dhand. In the compartments north of the band, kandi also predominates, unmixed in the north and mixed with indifferent lai as the band is approached. Average density: ·7. Quality: Fair, except on elevated sites. Reproduction: Chiefly coppice in coupes exploited since 1895-96. Kandi seedlings are established on the south where irrigation is good, and also in shallow depressions.	
Do. ...	Keti Bagarji.	7,457 23	Bounded on the north partly by revenue land of deh Jhali and partly by Bagarji forest; on the east partly by Bagarji forest and partly by revenue land of deh Bagarji; on the south by the river Indus and jagir of Mir Ghulam Haidar Khan, Talpur; and on the west by Andaldal forest.	Conterminous with the last and on the bank of the river 10 miles off the west of Sukkur. The soil varies from a light sandy loam to pure sand. The surface level is rather high so that the area does not come under water, except in very high floods. A few dhoros and depressions fill with water but do not distribute everywhere. The eastern compartments immediately above the river are watered in ordinary years.	WORKING CIRCLE I—EAST. The compartments on the east, which are inundated, have mixed crops of bahan, babul and kandi, both mature and immature, with up-land blanks intervening, and along the bank of the dhand. Lai occurs dense in the extreme east and along the margins of dhoros, but, elsewhere, it is poor if not already gone. Up-lands are covered with ak, bodhoo and other inferior species common to sandy wastes. The western compartments representing the interior and north of the forest, are very indifferently stocked with scattered mature and immature kandi, while two belts of babul, lai and bahan, mixed, cross the interior from east to west along the beds and banks of dhoros. A dense belt of mature babul marks the course of the southern boundary. Babul once covered the area. Average density: ·5. Quality: Babul, kandi and bahan are exploitable for fuel. Lai is poor except under irrigation. The area is insufficiently stocked. Reproduction: Is confined to the south-eastern compartments which have been exploited. Kandi seedlings are seen elsewhere but are thriving. Coppice is profuse in closed coupes and seedling kandi is established under irrigation. Up lands are bare but for what grows on them. WORKING CIRCLE II—WEST. Lai is the prevailing species, dense and well grown, forming pure crops on the low-lying lands of the south and south-east. Elsewhere, it is mixed with kandi, immature bahan and scattered mature babul. The northern compartments are partly blank and partly covered with dead and moribund lai mixed with very indifferent immature kandi. Fire has been very destructive and has helped to bring about the denudation noticed above. Some mature babul stands at the south-east corner, and on the east of compartments C8 and D8 mixed with mature and immature bahan. Average density: ·4. Quality: The standing stock is fit, but there is not enough of it. Reproduction: Coppice is good in closed coupes. Kandi seedlings are confined to parts which receive water. Portions of compartments C11, D11 and D12 have been regenerated, it is said, with the aid of cereal crops.	The irrigation of the forest must depend on the natural overflow of the river. The latter is now eroding its right bank. Irrigation depends entirely on the river. The change in the latter since 1901 promises well for the future of the forest.

Range.	Forest.	Area.	Boundaries.	Situation, configuration and soil.	Description of stock.	Remarks.
		A. S.				
Sukkur.	Bagarji.	3,932 16	Bounded on the north by revenue lands of dehs Kazi Wahan and Maka; on the east by revenue lands of dehs Mangrani, Tamaghani and Bagarji; on the south partly by revenue land of deh Bagarji and partly by Keti Bagarji forest; on the west by Keti Bagarji forest and revenue lands of dehs Mubarakpur, Jhalli, Kalwari and Kazi Wahan.	On the line of railway near Bagarji station. Configuration as usual. The soil is a good sandy loam showing little or no trace of pure sand anywhere. Sukkur band, arrests the overflow, and irrigation now depends on two sluices in the the Sukkur canal. Water is allowed to run for 10 days at a time, once in June and again in September; only low-lying portions are irrigated. Compartments D^6, D^7, E^6 and E^7 get water partly by overflow of and partly by percolation from zamindari canals leading water through the forest to revenue cultivation. The southern portion gets water only in very high flood.	The railway to Sukkur and the Sukkur canal running side by side divides the forest into two parts which, for the purpose of working plans, form separate working circles:— Working Circle I—North. The stock consists of kandi and lai, the former preponderating, asri is likewise seen and a few mature babul in the compartments facing the Sukkur canal. The density is fairly regular and low-lying portions irrigated by the canal bear thriving and luxuriant crops. In the northern compartments to which irrigation does not extend "kalar" is seen and growth is rather indifferent mixed with kirrar (*capparis aphylla*). The area was formerly covered with babul which has disappeared in the course of exploitation, and reproduction of the species is now impossible under altered conditions of irrigation. Average density: 8. Quality: Good; fit for exploitation. Reproduction: Very good in compartments felled over and closed between 1895 and 1898. The 1898-99 and 1900-1901 compartments are not quite satisfactory in the matter of seedlings. Established seedlings are not numerous, and recent seedlings, nil; compartments C^4, E^4 and E^5 show rather good material reproduction by seed owing, probably, to irrigation from adjacent cultivation. Working Circle II—South. This comprises the part of the forest south of the railway. There are two parts of revenue land aggregating 95 acres in area, inside forest. The Jhalli band stretches across the forest north-west to south-east parallel with the railway and about 2 miles from it. The area included between it and the railway can only be irrigated by the Sukkur canal through openings in the railway embankment. Such openings exist for the purpose of irrigating the revenue lands referred to above. Kandi and lai are the principal species. Bahan and babul are seen but only scattered. On the whole the growth is poor, the best being found between the bund and the railway, except in compartment 35 which contains only very scattered kandi and moribund lai and other inferior species. The eastern and southern compartments are very indifferently stocked, the level of the surface being above the reach of overflow of the dhand on their boundaries. Blanks appear and the growth is fast thinning out. Blanks on the extreme south have been sown with field crops with a view to reboisment, but results are bad. Average density: 6. Quality: Indifferent; area insufficiently stocked. Reproduction: After-growth in closed coupes is fair, but seedlings are not numerous enough.	More attention is needed to the irrigation of the forest by the Sukkur canal. Two sluices exist one in compartment, D^6 and one in compartment F^3 with two additional sluices in compartments C^7 and F^8 the condition of the growth would be much improved. A proper distribution of the water supply available by a system of small channels from the main channel would bring a larger area under irrigation than if the water is allowed to flow at random anywhere. The Sukkur canal might be allowed to assist in the irrigation of the part between the band and the railway. The other part must depend on the overflow of the river in extraordinary floods.